Claims

What is claimed is:

1. A method of filtering pixels of a video frame of a sequence of video frames, said method comprising:

     determining a pixel value difference between a pixel of a current frame and a corresponding pixel of a temporally previous frame; and

     adaptively filtering said pixel of said current frame using a filter coefficient, said adaptively filtering comprising employing said pixel value difference to select said filter coefficient for use in filtering said pixel.

2. The method of claim 1, wherein the adaptively filtering comprises employing at least one threshold and at least two filter coefficients, wherein said filter coefficient is automatically selected by said adaptively filtering from said at least two filter coefficients depending upon said pixel value difference relative to said at least one threshold.

3. The method of claim 2, wherein said adaptively filtering further comprises programmably, adaptively filtering said pixel of said current frame using said filter coefficients, and wherein at least one of said at least one threshold and said at least two filter coefficients can be programmably varied.

4.   The method of claim 2, wherein the at least one threshold comprises a first threshold and a second threshold, and wherein the at least two filter coefficients comprises a first filter coefficient, a second filter coefficient and a third filter coefficient, wherein said first filter coefficient is selected by the adaptively filtering if the pixel value difference is below said first threshold, said second filter coefficient is selected by the adaptively filtering if the pixel value difference is between said first threshold and said second threshold, and said third filter coefficient is selected by the adaptively filtering if the pixel value difference is greater than said second threshold.

5.   The method of claim 1, wherein said adaptively filtering further comprises outputting a filtered pixel value (FPV), wherein said FPV is determined by:

$$FPV = P1(f) + P2(1-f)$$

wherein:
    P1 = pixel value of a current pixel
    P2 = pixel value of the corresponding (x,y) pixel in
         the temporally previous frame
    f = selected filter coefficient.

6.   The method of claim 1, further comprising implementing said method within temporal filter logic integrated with a repeat field detection unit of a video encoder.

7. The method of claim 6, wherein said implementing includes integrating said determining of the pixel value difference with said repeat field detection unit of said video encoder, said integrating comprising employing difference calculation logic within the repeat field detection unit to determine said pixel value difference.

8.   A system for filtering pixels of a video frame of
a sequence of video frames, said system comprising:

a temporal filter, said temporal filter
comprising:

means for determining a pixel value
difference between a pixel of a current frame and
a corresponding pixel of a temporally previous
frame; and

means for adaptively filtering said pixel of
said current frame using a filter coefficient,
said means for adaptively filtering comprising
means for employing said pixel value difference to
select said filter coefficient for use in
filtering said pixel.

9.   The system of claim 8, wherein said means for
adaptively filtering comprises means for employing at least
one threshold and at least two filter coefficients, wherein
said filter coefficient is automatically selected by said
means for adaptively filtering from said at least two filter
coefficients depending upon the pixel value difference
relative to the at least one threshold.

10. The system of claim 9, wherein said means for adaptively filtering further comprises means for programmably, adaptively filtering said pixel of said current frame using said filter coefficients, and wherein at least one of said at least one threshold and said at least two filter coefficients can be programmably varied.

11. The system of claim 9, wherein the at least one threshold comprises a first threshold and a second threshold, and wherein said at least two filter coefficients comprise a first filter coefficient, a second filter coefficient, and a third filter coefficient, wherein said first filter coefficient is selected by said means for adaptively filtering if the pixel value difference is below said first threshold, said second filter coefficient is selected by the means for adaptively filtering if the pixel value difference is between said first threshold and said second threshold, and said third filter coefficient is selected by the adaptively filtering if the pixel value difference is greater than said second threshold.

12. The system of claim 8, wherein said adaptively filtering further comprises means for outputting a filtered pixel value (FPV), wherein said FPV is determined by:

$$FPV = P1(f) + P2(1-f)$$

wherein:
   P1 = pixel value of a current pixel
   P2 = pixel value of the corresponding (x,y) pixel in
        the temporally previous frame
   f = selected filter coefficient.

13. The system of claim 8, further comprising a repeat field detection unit for a video encoder, and wherein said temporal filter is integrated with said repeat field detection unit.

14. The system of claim 13, wherein said means for determining of said temporal filter comprises memory fetch logic and difference calculation logic within the repeat field detection unit, said memory fetch logic comprising means for fetching said corresponding pixel of a temporally previous frame, and said difference calculation logic comprising means for calculating said pixel value difference.

15. At least one program storage device readable by a
machine, tangibly embodying at least one program of
instructions executable by the machine to perform a method
of filtering pixels of a video frame of a sequence of video
frames, said method comprising:

   determining a pixel value difference between a
   pixel of a current frame and a corresponding pixel of a
   temporally previous frame; and

   adaptively filtering said pixel of said current
   frame using a filter coefficient, said adaptively
   filtering comprising employing said pixel value
   difference to select said filter coefficient for use in
   filtering said pixel.

16. The at least one program storage device of claim
15, wherein said adaptively filtering comprises employing at
least one threshold and at least two filter coefficients,
wherein said filter coefficient is automatically selected by
said adaptively filtering from said at least two filter
coefficients depending upon the pixel value difference
relative to the at least one threshold.

17. The at least one program storage device of claim
16, wherein said adaptively filtering further comprises
programmably, adaptively filtering said pixel of said
current frame using said filter coefficients, and wherein at
least one of said at least one threshold and said at least
two filter coefficients can be programmably varied.

18. The at least one program storage device of claim 16, wherein the at least one threshold comprises a first threshold and a second threshold, and wherein the at least two filter coefficients comprises a first filter coefficient, a second filter coefficient and a third filter coefficient, wherein said first filter coefficient is selected by the adaptively filtering if the pixel value difference is below said first threshold, said second filter coefficient is selected by the adaptively filtering if the pixel value difference is between said first threshold and said second threshold, and said third filter coefficient is selected by the adaptively filtering if the pixel value difference is greater than said second threshold.

19. The at least one program storage device of claim 15, wherein said adaptively filtering further comprises outputting a filtered pixel value (FPV), wherein said FPV is determined by:

$$FPV = P1(f) + P2(1-f)$$

wherein:

P1 = pixel value of a current pixel
P2 = pixel value of the corresponding (x,y) pixel in
         the temporally previous frame
f = selected filter coefficient.

20. The at least one program storage device of claim 15, further comprising automatically repeating said determining and said adaptively filtering for pixels of multiple video frames of the sequence of video frames.

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